

Confirmation no. 6713

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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| Applicant: | BOYLE <i>et al.</i> | Examiner: | Trinh, T. |
| Serial No.: | 10/556,242 | Group Art Unit: | 2618 |
| Filed: | November 10, 2005 | Docket No.: | GB030076US (NXPS.455PA) |
| Title: | WIRELESS TERMINALS | | |

APPEAL BRIEF

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Dear Sir:

This Appeal Brief is submitted pursuant to 37 C.F.R. §41.37, in support of the Notice of Appeal filed April 16, 2010 and in response to the rejections of claims 1-5, 8-17 and 20 as set forth in the Final Office Action dated January 28, 2010.

Please charge Deposit Account No. 50-4019 (GB030076US) \$540.00 for filing this brief in support of an appeal as set forth in 37 C.F.R. §1.17(c). If necessary, authority is given to charge/credit Deposit Account 50-4019 additional fees/overages in support of this filing.

I. Real Party In Interest

The real party in interest is NXP Semiconductors. The application is presently assigned of record, at reel/frame nos. 019719/0843 to NXP, B.V., headquartered in Eindhoven, the Netherlands.

II. Related Appeals and Interferences

While Appellant is aware of other pending applications owned by the above-identified Assignee, Appellant is unaware of any related appeals, interferences or judicial proceedings that would have a bearing on the Board's decision in the instant appeal.

III. Status of Claims

Claims 1-5, 8-17 and 20 stand rejected and are presented for appeal. Claims 6-7 and 18-19 are objected to as being dependent upon a rejected base claim but are noted as being allowable if rewritten. A complete listing of the claims under appeal is provided in an Appendix to this Brief.

IV. Status of Amendments

No amendments have been filed subsequent to the Final Office Action dated January 28, 2010.

V. Summary of Claimed Subject Matter

As required by 37 C.F.R. § 41.37(c)(1)(v), a concise explanation of the subject matter defined in the independent claims involved in the appeal is provided herein. Appellant notes that representative subject matter is identified for these claims; however, the abundance of supporting subject matter in the application prohibits identifying all textual and diagrammatic references to each claimed recitation. Appellant thus submits that other application subject matter, which supports the claims but is not specifically identified above, may be found elsewhere in the application. Appellant further notes that this summary does not provide an exhaustive or exclusive view of the present subject matter, and Appellant refers to the appended claims and their legal equivalents for a complete statement of the invention.

Commensurate with independent claim 1, various example embodiments are directed to a wireless terminal including a substrate having a ground plane thereon, RF components mounted on the substrate, and a PIFA (Planar Inverted-F Antenna) having connections electrically coupled to the ground plane. *See, e.g.*, Figure 2 (10, 16, N) and page 5:2-23. A notch antenna is in the substrate for receiving signals, and de-activating circuitry is provided for de-activating the notch antenna when the PIFA is being used for transmitting signals. *See, e.g.*, Figure 7 (36) and page 8:8-25.

Commensurate with independent claim 9, another example embodiment is directed to a wireless module comprising a substrate having RF components mounted thereon, circuitry for connection to a PIFA (Planar Inverted-F Antenna), a notch antenna in the substrate, and de-activating circuitry for de-activating the notch antenna. *See, e.g.*, Figures 2 (10, 16, N) and 7 (36), and pages 5:2-23 and 8:8-25.

Commensurate with independent claim 12, another example embodiment is directed to a wireless telephony device comprising telephony circuitry for processing and communicating telephony signals, a ground plane, and a transmission antenna electrically coupled to the ground plane and adapted to transmit telephony signals from the telephony circuitry. *See, e.g.*, Figure 2 (10, 16, N) and page 5:2-23. The device further comprises a notch antenna to receive wireless telephony signals for use by the telephony circuitry, and a de-activating circuit to selectively connect the notch antenna for receiving and processing signals at the telephony circuitry, and for de-activating the notch antenna when the transmission antenna is used for transmitting signals. *See, e.g.*, Figure 7 (36) and page 8:8-25.

VI. Grounds of Rejection to be Reviewed Upon Appeal

The grounds of rejection to be reviewed on appeal are as follows:

- A. Claims 1-5 and 9-17 stand rejected under 35 U.S.C. § 103(a) over Sanford (U.S. Patent No. 6,424,300) in view of Rousu (U.S. Patent Pub. 2003/0114188).
- B. Claims 8 and 20 stand rejected under 35 U.S.C. § 103(a) over the '300 and '188 references in view of Schamberger (U.S. Patent Pub. 2003/0117331).

VII. Argument

Appellant notes that claims 6-7 and 18-19 stand objected to but indicated to be allowable if rewritten. For purposes of Appeal, Appellant understands these claims to be allowable in view of the following discussion, establishing the impropriety of the rejections of independent claims 1 and 12 from which claims 6-7 and 18-19 respectively depend.

A. The § 103(a) Rejection Of Claims 1-5 And 9-17 Over The Sanford '300 and Rousu '188 References Is Improper.

1. There Is No Proper Motivation To Combine The '300 and '188 References Because The Cited References Teach Away From The Combination As Evident In The '300 Reference Becoming Inoperable.

The § 103 rejections of claims 1-5, 8-17 and 20 should be reversed because the cited references teach away from the Office Action's proposed combination of references, and more generally from any modification of the primary '300 reference in accordance with the claimed invention, and the modification further renders the '300 reference inoperable for its purpose involving simultaneous antenna operation. The Final Office Action failed to address this matter directly and overcome Applicant's traversals in the (now uncontested) record (the Examiner simply discussed some unrelated argument that motivation is to "obtain flexible choices"). Consistent with the recent Supreme Court decision in *KSR*, M.P.E.P. § 2143.01 explains the long-standing principle that a § 103 rejection cannot be maintained when the asserted modification undermines either the operation or the purpose of the main ('300) reference - the rationale being that the prior art teaches away from such a modification. *See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 417 (U.S. 2007) ("[W]hen the prior art teaches away from combining certain known elements, discovery of a successful means of combining them is more likely to be non-obvious.").

As applicable here, the '300 reference teaches away from the proposed combination of references and the resulting modification, which would render the '300 reference inoperable for its purpose of making simultaneous antenna operation possible by addressing issues of "[i]nterference and/or coupling." *See* column 2:22-38. As relative to previous approaches that had required that antenna functions be "undesirably" disabled (*id.*), the '300 reference addresses these undesirable conditions to permit simultaneous operation. To suit

its stated purpose, the '300 reference uses a notch antenna (generally as a GPS antenna) together with one or more other cell phone antennas, where the respective antennas serve different purposes and perform different functions at the same time. *See, e.g.*, Col. 6:19-22 of the '300 reference. The '300 reference thus uses its notch antenna to address problems as identified in the reference's background and discussed above, solving a "need for GPS antennas that ... can be isolated from other antennas" to reduce interference and/or coupling and facilitate simultaneous operation. In expressly reciting that such prior approaches "may undesirably disable the GPS function when the cell phone is in a normal talk position," the '300 reference further teaches away from the claimed approach involving the disabling of an antenna and the Examiner's proposed modification. *See* Col. 2:22-24 of the '300 reference, in which a "GPS patch antenna" would be disabled.

In view of the above, the '300 reference expressly teaches away from the proposed modification (and the claimed invention), which modification would also undermine the purpose of the '300 reference. Under M.P.E.P. § 2143.01, the rejections cannot be maintained and Appellant requests the § 103(a) rejections of claims 1-5, 8-17 and 20 be reversed.

2. There Is No Motivation To Combine The '300 and '188 References Because The '300 Reference Already Solves The Asserted Problem Upon Which The Combination Is Predicated.

The Examiner has failed to establish a proper motivation for modifying the '300 reference as asserted, because the alleged motivation neither accomplishes what the Examiner asserts nor is needed in view of already-present functionality in the '300 reference. Specifically, the alleged motivation is to "provide less current consumption" and "reduced heating" as the primary '300 reference already reduces current consumption and heating in another manner, such that modifying the '300 reference as asserted would not function to do so. The Office Action is silent as to how the proposed combination would further reduce current consumption and/or heating, and provides no explanation whatsoever as to how these ends would be achieved via the combination.

While the Examiner has provided no supporting evidence substantiating these assertions of reduced current consumption and/or heating, Appellant further submits that the

proposed combination would appear to actually increase current and heating, relative to the pre-modified operation of the '300 reference. For example, the '300 reference addresses problems discussed in its background as directed to nearby antenna circuits that "absorb power" from another antenna, but isolating the antennas from one another. The antennas disclosed in the '300 reference are isolated and small, and thus passively mitigate current consumption without the use of additional circuitry (or power to operate such circuitry). *See, e.g.*, column 2:28-42 of the '300 reference. In place of a switch, isolation is achieved by the two antennas being arranged such that the polarization of the second antenna is nominally orthogonal to that of the primary antenna, and through out-of-band mismatch. *See, e.g.*, column 15:34-40. In contrast, the proposed modification would involve adding a switch (SW1 and SW2) to the '300 reference, which would thus involve the use of power for controlling and operating the switches and thus appear to actually increase power, contrary to the Examiner's indications.

Accordingly, nothing in the record supports the Examiner's asserted motivation regarding the reduction of current (and power) consumption. Instead, the references suggest that the proposed modification would actually do the opposite and increase power consumption. Particularly in light of the *KSR* decision, the law under § 103 is clear that one of ordinary skill in the art having common sense at the time of the invention would not have looked to the secondary ('188) reference to solve a problem already solved by the primary ('300) reference, particularly where the proposed combination would not only appear to fail to solve the asserted problem, it would actually make the problem worse. *See, e.g., Ex Parte Rinkevich et al.*, Appeal 20071317, decided May 29, 2007 ("one of ordinary skill in the art having common sense at the time of the invention would not have reasonably looked to [the primary reference] to solve a problem already solved by [the secondary reference]."). Appellant therefore submits that there is no motivation to modify the '300 reference and requests that the § 103 rejection be reversed.

3. The Proposed Combination Of The '300 And '188 References Do Not Correspond To Claims 3, 11 and 15 As Asserted.

As consistent with the above, the rejections of claims 3, 11 and 15 are improper because the cited references teach away from the Office Action's proposed combination of references and from any modification of the primary '300 reference in accordance with the claimed invention. The Examiner has also failed to establish a proper motivation for modifying the '300 reference as asserted, because the alleged motivation neither accomplishes what the Examiner asserts nor is needed in view of already-present functionality in the '300 reference. Accordingly, the proposed combination of references fails to establish an (enabled) embodiment corresponding to the claimed invention.

The § 103 rejections of claims 3, 11 and 15 are also improper because the Final Office Action failed to cite references corresponding to limitations directed to deactivating a PIFA/transmission antenna during activation of a notch antenna, and erroneously construes a single antenna with two separate lengths as two separate antennas that are activated/deactivate. Referring to cited Figures 4A and 4B, each respective figure shows a strip antenna with separate strips that can be selectively connected by switches SW1 and SW2. This is consistent with the discussion of the antennas at paragraph 0025. Accordingly, the switches SW1 and SW2 do not activate/deactivate different antennas, but rather vary the length of a single antenna. The Examiner then goes on to assert that:

In this case, activation notch antenna to deactivate other notch antenna or activation the PIFA antenna and de-activate other the PIFA antenna is obvious to activation notch antenna to de-activate the PIFA.

Appellant submits that, in addition to being generally incomprehensible, this assertion's apparent suggestion that deactivating a second PIFA/transmission antenna is somehow obvious from the discussion of the operation of a strip antenna in changing its length is untenable. Nowhere in the Office Action nor in the cited references is any explanation provided that would suggest that such strip antenna length adjustment would somehow correspond to deactivating a PIFA antenna, in the context of the claimed invention or otherwise.

In view of the above, Appellant requests that the § 103 rejection be reversed as the cited combination of references fails to correspond to limitations in claims 3, 11 and 15.

B. The § 103(a) Rejection Of Claims 8 And 20 Over The Sanford ‘300, Rousu ‘118 And Schamberger ‘331 References Is Improper And Fails To Establish Correspondence To Performance-based Antenna Selection.

The rejections of claims 8 and 20, which respectively depend from claims 1 and 12, are improper for reasons including those discussed above in Section A. Specifically, the proposed combination of the ‘300 and ‘188 reference fails because the ‘300 reference teaches away from the claimed invention, and from the proposed modification to switch off and separately operate antennas. Moreover, the alleged motivation is misplaced, in that the purported current reduction appears to be unsupported at best, and likely inaccurate as adding a switch and related controls would appear to actually increase current, relative to the disclosed passive isolation-based approach in the ‘300 reference.

1. The Cited Portions Of The ‘331 Reference Fail To Disclose Limitations Directed To Selecting An Antenna Based On Measured Signal Quality.

The rejections of claims 8 and 20 are further improper because the cited portions of the ‘331 reference fail to disclose limitations as asserted in the Office Action. Referring to claim 8, which depends from claim 1, aspects of the claimed invention are directed to (in a wireless terminal) measuring the quality of signals “received by the PIFA and the notch antenna” and selecting “from one of the PIFA and notch antenna” for receiving signals. Claim 20, which depends from claim 12, is directed to similar limitations.

In attempting to assert correspondence to the above-discussed limitations, the Examiner has cited paragraphs 0007 and 0032-0034 of the ‘331 reference. However, these cited portions make no mention of both comparing antennas and selecting one of the antennas based upon the comparison. Paragraph 0007 discusses directly connecting amplifiers to antenna transmission lines, and paragraphs 0032-0034 discuss a chart showing performance characteristics of different antennas. None of these portions discuss a device that is configured to use any comparison of antenna performance to select an antenna for use.

Accordingly, the rejections have failed to establish correspondence to claim limitations directed to comparing antenna performance and selecting an antenna based upon this

comparison. Appellant therefore submits that the § 103 rejections of claims 8 and 20 are improper and requests that they be reversed.

2. The Cited Portions Of The ‘331 Reference Teach Away From Antenna Switching As In The Proposed Combination Of References.

The rejections of claims 8 and 20 are further improper because the cited ‘331 reference teaches away from using a switch to isolate antennas as in the proposed combination of references. As discussed above, consistent with the *KSR* decision, M.P.E.P. § 2143.01 explains the long-standing principle that a § 103 rejection cannot be maintained when the asserted modification undermines either the operation or the purpose of the references - the rationale being that the prior art teaches away from such a modification. *See KSR as cited above.*

As applicable here, adding the cited portions of the ‘331 reference to the proposed combination of references would involve directly coupling amplifiers “to the antenna transmission lines, thus avoiding the need for a duplexer or transmit/receive switch component.” *See* cited paragraph 0007 in the ‘331 reference. Accordingly, this proposed combination (to permit a comparison) would vitiate the operation of the switch added from the ‘188 reference in an attempt to arrive at the claimed invention. Appellant therefore submits that there is no motivation to combine the references as asserted, and requests that the rejections be reversed.

VIII. Conclusion

In view of the above, Appellant submits that the rejections of claims 1-5, 8-17 and 20 are improper and therefore requests reversal of the rejections as applied to the appealed claims and allowance of the entire application. Appellant further would understand that claims 6-7 and 18-19 are also allowable in view of the believed allowability of the respective independent claims 1 and 12 from which claims 6-7 and 18-19 depend.

Authority to charge the undersigned's deposit account was provided on the first page of this brief.

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APPENDIX OF CLAIMS INVOLVED IN THE APPEAL
(S/N 10/556,242)

1. A wireless terminal including
 - a substrate having a ground plane thereon,
 - RF components mounted on the substrate,
 - a PIFA (Planar Inverted-F Antenna) having connections electrically coupled to the ground plane, and
 - the RF components characterised in that
 - a notch antenna is provided in the substrate for receiving signals, and
 - de-activating circuitry is provided for de-activating the notch antenna when the PIFA is being used for transmitting signals.
2. A wireless terminal as claimed in claim 1, characterised in that the PIFA is a dual band slotted planar patch antenna.
3. A wireless terminal as claimed in claim 1, characterised in that the notch antenna is a passive notch antenna and the de-activating circuitry is responsive to activation of the notch antenna to de-activate the PIFA.
4. A wireless terminal as claimed in claim 1, characterised in that the de-activating circuitry comprises a circuit for de-tuning the notch antenna.
5. A wireless terminal as claimed in claim 1, characterised in that capacitance means are connected across the notch for tuning the notch antenna and in that the circuitry for de-activating the notch antenna comprises means for shorting the capacitance means.
8. A wireless terminal as claimed in claim 1, characterised by means for measuring the contemporaneous quality of signals received by the PIFA and the notch antenna and for selecting for receiving signals from one of the PIFA and notch antenna that is receiving the better quality signals.

9. A wireless module comprising
a substrate having RF components mounted thereon,
circuitry for connection to a PIFA (Planar Inverted-F Antenna), a notch antenna in the substrate, and
de-activating circuitry for de-activating the notch antenna.
10. A wireless module as claimed in claim 9, characterised in that the notch antenna is a passive notch antenna, capacitance means are connected across the notch for tuning the notch antenna and in that the circuitry for deactivating the notch antenna comprises means for shorting the capacitance means.
11. The wireless module of claim 9, wherein the de-activating circuitry couples the notch antenna when the wireless module is used for receiving signals, and de-activates the notch antenna when the PIFA is used for transmitting signals.
12. A wireless telephony device comprising:
telephony circuitry for processing and communicating telephony signals;
a ground plane;
a transmission antenna electrically coupled to the ground plane and adapted to transmit telephony signals from the telephony circuitry;
a notch antenna to receive wireless telephony signals for use by the telephony circuitry; and
a de-activating circuit to selectively connect the notch antenna to for receiving signals and processing signals at the telephony circuitry, and for de-activating the notch antenna when the transmission antenna is used for transmitting signals.
13. The device of claim 12, wherein the transmission antenna is a PIFA (Planar Inverted-F Antenna), and wherein the notch antenna is a passive notch antenna.

14. The device of claim 12, wherein the de-activating circuit couples the notch antenna when the telephony circuitry is used for receiving signals, and de-activates the notch antenna when the transmission antenna is used for transmitting signals.
15. The device of claim 12, wherein the de-activating circuit de-activates the transmission antenna in response to activation of the notch antenna.
16. The device of claim 12, wherein the de-activating circuit de-activates the notch antenna by de-tuning the notch antenna.
17. The device of claim 12,
further including a capacitance circuit connected across the notch antenna for tuning the notch antenna, and
wherein the de-activating circuit shorts the capacitance circuit to selectively de-activate the notch antenna.
20. The device of claim 12, further including a circuit to
measure the contemporaneous quality of signals received by the transmission and the notch antennas, and
select, for receiving signals, one of the PIFA and notch antenna that is receiving a better quality signal.

APPENDIX OF EVIDENCE

Appellant is unaware of any evidence submitted in this application pursuant to 37 C.F.R. §§ 1.130, 1.131, and 1.132.

APPENDIX OF RELATED PROCEEDINGS

As stated in Section II above, Appellant is unaware of any related appeals, interferences or judicial proceedings.